L Number	Hits	Search Text	DB	Time stamp
1	5	(transistor) and (consistent with gate with voltage) and (saturation with mobility)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/06/25 11:18

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INSPEC - 1969 to date (INZZ)

Accession number & update
3292214, A89019809, B89008069; 890000.

Title
Production of high-quality **amorphous** silicon films by **evaporative silane** surface decomposition.

Author(s)
Doyle-R; Robertson-R; Lin-G-H; He-M-Z; Gallagher-A.

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Joint Inst for Lab Astrophys, Colorado Univ, Boulder, CO, USA.

Source
Journal-of-Applied-Physics (USA), vol.64, no.6, p.3215-23, 15 Sept. **1988.**

CODEN
JAPIAU.

ISSN
ISSN: 0021-8979, CCCC: 0021-8979/88/183215-09 ($02.40).

Publication year
1988.

Language
EN.

Publication type
J Journal Paper.

Treatment codes
X Experimental.

Abstract
High-quality hydrogenated **amorphous** silicon films (a-Si:H) have been produced by decomposition of low-pressure **silane** gas on a very hot surface with deposition of low-pressure **silane** gas on a very hot surface with deposition on a nearby, typically 210 degrees C substrate. A high-temperature tungsten filament provides the surface for heterogeneous thermal decomposition of the low-pressure **silane** and subsequent evaporation of atomic silicon and hydrogen. These evaporated species (primarily) induce a-Si:H growth on nearby substrates which are temperature controlled using a novel substrate holder. The light and dark conductivities, optical band gap, deposition rates, and light-soaking effects of preliminary films are reported. The decomposition-evaporation process has been examined using a mass spectrometer to directly detect the decomposition rate and the evaporated radical species. Based on this data and other information, a simplified model for the deposition process is suggested. The excellent **film** quality and the attributes of the deposition process make this technique, which was originally suggested by Wiessman, viable for the fast rate, large-area

deposition of a-Si:H for solar cells and other applications. (35 refs).

Descriptors

amorphous-semiconductors; CVD-coatings; dissociation; elemental-semiconductors; energy-gap; hydrogen; semiconductor-thin-films; silicon.

Keywords

semiconductor; CVD; low pressure **silane** gas; low pressure **silane** gas; thermal decomposition; optical band gap; deposition rates; light soaking effects; decomposition evaporation process; mass spectrometer; **film** quality; solar cells; **amorphous** Si:H.

Classification codes

A8115H (Chemical vapour deposition).
A6855 (Thin **film** growth, structure, and epitaxy).
A7360F (Semiconductor films).
B0520F (Vapour deposition).
B2520F **(Amorphous** and glassy semiconductors).

Chemical indexing

Si:H int, Si int, H int, Si:H bin, Si bin, H bin, Si el, H el, H dop.

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☐ **document 1 of 7** Order Document

INSPEC - 1969 to date (INZZ)

Accession number & update
4775689, B9411-2560R-042; 941006.

Title
Inverse-staggered polycrystalline silicon thin-film transistors fabricated by excimer laser irradiation.

Author(s)
Ono-K; Ogawa-K; Sakuta-H; Konishi-N.

Author affiliation
Hitachi Res Lab, Hitachi Ltd, Japan.

Source
Electronics-and-Communications-in-Japan-Part-2 (Electronics)(USA), vol.76, no.12, p.40-7, Dec. **1993.**

CODEN
ECJEEJ.

ISSN
ISSN: 8756-663X, CCCC: 8756-663X/93/0012-0040.

Publication year
1993.

Language
EN.

Publication type
J Journal Paper.

Treatment codes
X Experimental.

Abstract
Fundamental device performance, mobility distribution, and threshold voltage shift characteristics of inverted **staggered** polycrystalline thin-film transistors (TFTs) are discussed. The present TFT uses a polycrystalline silicon (p-Si) crystallized by excimer laser as semiconductor layer and SiN prepared by CVD method as gate insulator. The TFT was fabricated onto glass substrate of 100 mm/sup 2/ at a maximum temperature of 300 degrees C. Measurements of the distribution of mobility were carried out with devices placed at every 0.3 mm pitch. As a result, the mobility mu of TFT made at laser intensity of 200 mJ/cm/sup 2/ is 20.9 cm/sup 2//V.s and the off-current is 2*10/sup 11/A. TFT was found to be very uniform except for a region where a superposition of 200 mJ/cm/sup 2/ laser irradiation over a weak laser intensity was made. The analysis indicates that the region for low micrometer is the area irradiated by a laser intensity 110 to 170 mJ /cm/sup 2/. The region irradiated with laser intensity of this range also was found to be in a mixed state of amorphous silicon of

depleted hydrogen atoms and crystalline consisting of fine grains. A shift voltage at 20 V gate DC voltage at 10/sup 4/ s after the application of the voltage is 0.2 V, 1/25 time smaller compared to a-Si TFT. The present p-Si TFT is demonstrated to exhibit high-device performance for liquid crystal display. (19 refs).

Descriptors

chemical-vapour-deposition; elemental-semiconductors; excimer-lasers; laser-beam-applications; liquid-crystal-displays; silicon; thin-film-transistors.

Keywords

inverse staggered polycrystalline silicon TFT; thin film transistors; excimer laser irradiation; fundamental device performance; mobility distribution; threshold voltage shift; semiconductor layer; SiN gate insulator; CVD method; glass substrate; weak laser intensity; low micrometer; mixed state; amorphous silicon; depleted hydrogen atoms; crystalline fine grain Si; p Si TFT; device performance; liquid crystal display; 300 C; 20 V; 0.2 V; Si SiN.

Classification codes

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B2560R    (Insulated gate field effect transistors).
B4150D    (Liquid crystal devices).
B2520C    (Elemental semiconductors).
B4360     (Laser applications).
```

Chemical indexing

Si-SiN int, SiN int, Si int, N int, SiN bin, Si bin, N bin, Si el.

Numerical indexing

temperature: 5.73E+02 K;
voltage: 2.0E+01 V, 2.0E-01 V.